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Fatal Fires

FINDINGS

- Each year, an estimated 3,600 fatal fires claim the lives of 4,300 civilians. 83% involved a single fatality and 17% involved multiple fatalities.
- Injuries are 22 times as great and property losses are 16 times as great in fatal fires as in nonfatal fires.
- 78% of fatal fires occurred in structures, 94% of these on residential properties.
- 92% of fatal fires occur either in homes or in cars.
- The leading cause of fires that cause at least one fatality is smoking (24%), followed closely by arson (20%).
- The leading areas of fire origin in fatal fires are lounge and sleeping areas (60%).
- Fatal fires are most common in the winter.
- Smoke alarms either were not present or did not operate in 75% of residences and 80% of non-residences.
- 63% of deaths are males. 25% of deaths are older population (over 64); 16% are children under 10.

Sources: NFIRS & NFPA

Of the nearly 2 million estimated fires reported annually to fire departments between 1996 and 1998, an estimated 3,600 fires claimed the lives of more than 4,300 civilians each year. These fatal fires also injured 1,200 civilians and caused almost $300 million in property damage.[1] Of the fatal fires reported over this 3-year period, 83% involved a single fatality, and 12% involved two fatalities. The remaining 5% of fatal fires involved between three and nine fatalities.[2] This report summarizes some of the major characteristics of fatal fires, with an emphasis on fatal fires in residential structures.

Loss Measures

Fatal fires are relatively few in number, but they are devastating in outcome. Losses from fatal fires are significantly higher than losses associated with losses from nonfatal fires. Dollar losses associated with fatal fires in general are more than 16 times that of all other fires. The injury rate for fatal fires is nearly 27 times that of all nonfatal fires. Flame damage is more extensive in fatal fires that in nonfatal fires. Fatal fires in residential structures had more than 4 times the dollar loss and 10 times the injury rate as nonfatal residential structure fires. In more than half of the fatal structure fires, flame damage extended throughout the structure whereas flame damages extended throughout the structure in only 18% of nonfatal structures. Figure 1 shows the loss measures for fatal and nonfatal fires in all properties and in residential properties alone.

Figure 1. Loss Measures in Fatal and Nonfatal Fires
(3-year average, NFIRS data 1996–98)

LOSS MEASURE	ALL FIRES			RESIDENTIAL STRUCTURE FIRES ONLY		
	ALL	ALL FATAL	ALL NONFATAL	ALL	ALL FATAL	ALL NONFATAL
Dollar Loss/Fire	$5,619	$97,270	$5,441	$11,271	$47,720	$11,045
Civilian Injuries/1,000 Fires	15.7	397.4	14.9	48.0	437.8	45.6
Civilian Fatalities/1,000 Fires	2.4	1,247.4	—	7.7	1,249.3	—

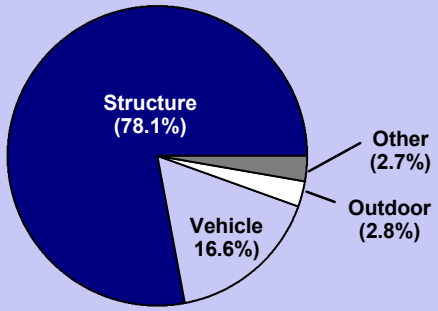
Source: NFIRS only

Where Fatal Fires Occur

Although fire occurs most frequently outdoors (38%), fatal fires occur most frequently in structures (78%). Of these fatal structure fires, 94% occur in residences. The overall result is that the overwhelming majority of fatal fires (73%) are residential structure fires.

Seventeen percent of fatal fires occurred in vehicles; the remaining 6% were evenly divided between outside and other types of fires. Figure 2 shows the graphical breakdown of where fatal fires occur.

Figure 2. Where Fatal Fires Occur
(3-year average, NFIRS data 1996–98, adjusted percentage)



Source: NFIRS only

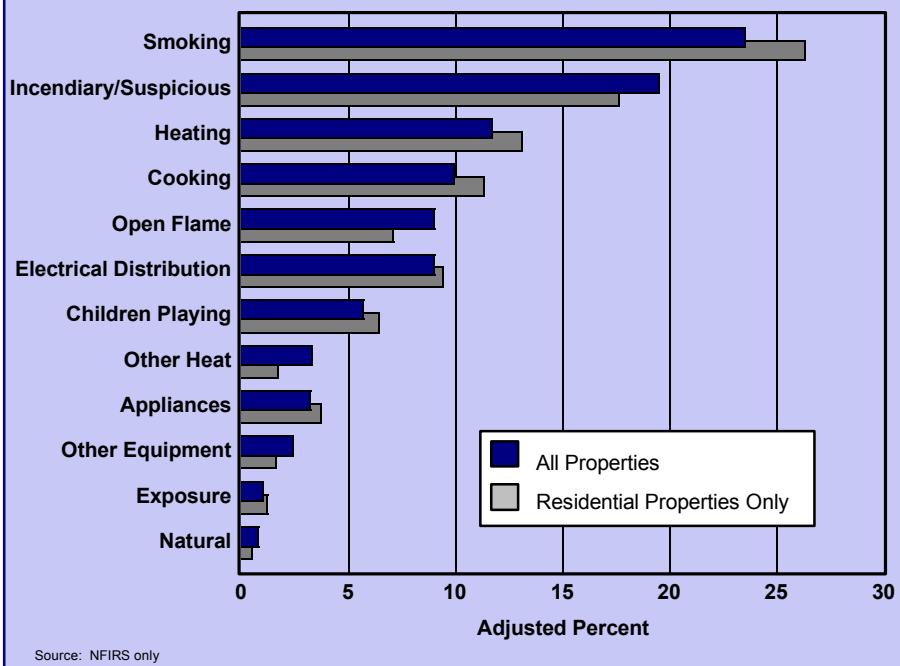
Causes of Fatal Fires

The leading cause of all fatal fires is smoking (24%). Smoking also accounts for more than one-quarter of the fatal fires in residential structures.

The second leading cause of fatal fires is incendiary/suspicious (arson), which accounts for nearly 20% of the fatal fires overall and 18% of the fatal fires in residential structures. The third leading cause of fatal fires is heating, at 12% overall and 13% in residential properties.

Multiple fatality fires are most often caused by arson (19%), followed by heating (18%). By contrast, smoking causes most single fatality fires (28%), followed by arson (17%). Figure 3 compares the causes of fatal fires in all properties and residential properties.

Figure 3. Causes of Fatal Fires
(3-year average, NFIRS data 1996–98)



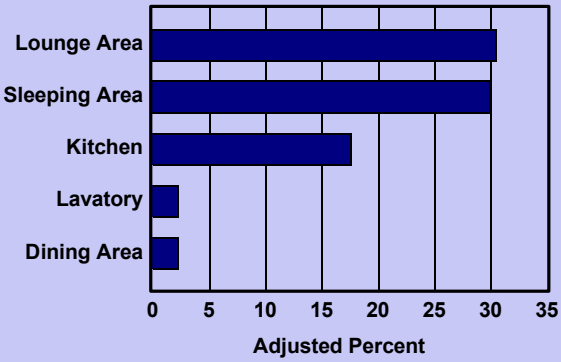
Source: NFIRS only

Where Fatal Residential Structure Fires Start

Figure 4 shows the leading areas of fire origin in fatal residential structure fires. They start most frequently in lounge and sleeping areas (30% each).[3] Fires starting in kitchens account for another 18%.

Figure 4. Where Fatal Residential Structure Fires Start

(3-year average, NFIRS data 1996–98)



Source: NFIRS only

When Fatal Fires Occur

Figure 5 shows the monthly breakdown of all reported fatal fires from 1996 to 1998. January has the most fatal fires with almost 13% of the annual total; March is second at 11% and December third at 10%. The frequency of fatal fires follows a seasonal trend, with fewer in the summer and more in the winter.

Smoke Alarm Performance

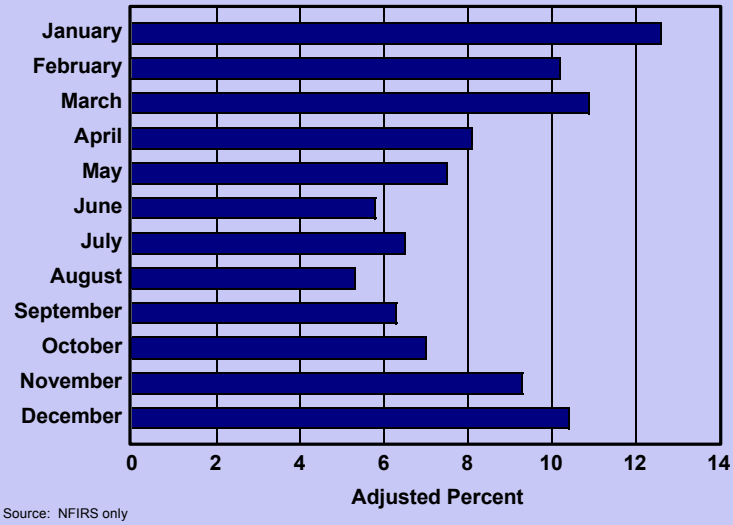
Smoke alarm performance in fatal structure fires is shown in Figure 6. Although more than 90% of homes have smoke alarms today, no smoke alarms were present in the majority of structural fires where fatalities occurred. In 77% of fatal non-residential structure fires and 55% of the fatal residential structure fires, no smoke alarms were present at the time of the fire. Smoke alarms were present in the room of origin and activated in only 11% to 12% of fatal structure fires. Smoke alarms activated in only 17% of non-residential structure fires and 21% of fatal residential structure fires.

Profile of Fatalities

Males are killed more frequently in fires (63%) than females, as has been the case for decades. Children up to 9 years old account for 16% of fire fatalities (Figure 7)—the largest for any decade in life. The older population (65 and over) is the single largest group of fatalities and account for one-quarter of all fire deaths.

Figure 5. Fatal Fires by Month

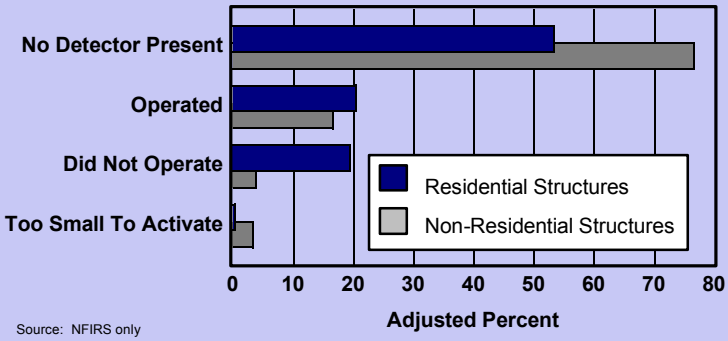
(3-year average, NFIRS data 1996–98)



Source: NFIRS only

Figure 6. Smoke Alarm Performance in Fatal Structure Fires

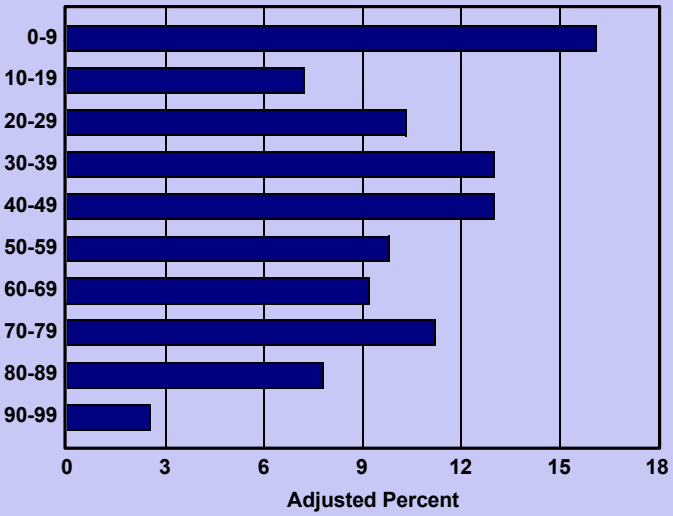
(3-year average, NFIRS data 1996–98)



Source: NFIRS only

Figure 7. Fire Fatalities by Age

(3-year average, NFIRS data 1996–98)



Source: NFIRS only

Forty-seven percent of those killed in fires were asleep at the time of injury. Twenty-seven percent were awake and were unimpaired. Nine percent were reported under the influence of drugs[4] or alcohol at the time of injury, but this may be an undercount because of the reluctance to report intoxication. (Only a few states routinely test blood alcohol levels for fire victims.) The largest percentage of fatalities were in the room or space of origin, followed by the floor or origin (26%).

Patterns in fire fatalities vary by fire cause. For example, for smoking fires (the leading cause of fatal fires), 60% of fatalities are asleep when the fire ignites. Further, 31% are intimately involved with the actual ignition of the fire.

Twenty-nine percent of fire fatalities were found in the room of fire origin at the time of ignition. An additional 26% were on the same floor as the fire origin; the rest were elsewhere in the building.

Examples

- On January 19, 2000, a fire that was intentionally set in a lounge area of a New Jersey college dormitory claimed the lives of 3 university students and injured 58 others. The fire was small but it created intense heat and thick plumes of black smoke that spread throughout the dormitory.[5]

- On January 3, 2001, an early morning fire that was caused by an pot full of hot cooking grease left unattended on an electric range of a Delaware home claimed the lives of 11 family members. Among the dead were seven children and four adults. Investigators found two smoke detectors in the house; neither had batteries.[6]

- An early morning house fire in a Washington, D.C., suburb on the night of Thanksgiving 2001 killed two adults and critically injured two others. Neighbors went into the house and pulled the couple's 21-year-old son to safety, but heat and smoke prevented the neighbor form reentering the house. Improperly discarded smoking materials in a basement couch caused the fire. The home's smoke alarm did not activate because the battery was dead.[7]

Conclusions

Most fatal fires are preventable. Preferably, people should smoke outside, and not when they are drowsy. Properly maintaining, routinely inspecting, and properly installing heating equipment can best prevent fatal fires caused by heating. Cooking should never be left unattended, and the cook should remain alert.

Efforts must be made to establish a fire-safe home, especially a safe sleeping environment. The presence of a properly installed and functioning smoke alarm can prevent many fire fatalities.

For further information on fatal fires, contact your local fire department or the USFA.

To review the detailed methodology used in this analysis, click **METHODOLOGY**

Notes:

1. National estimates are based on data from the National Fire Incident Reporting System (NFIRS) (1996–1998) and the National Fire Protection Association's (NFPA's) annual survey, *Fire Loss in the United States.*
2. Of the incidents reported to NFIRS from 1996–1998, the highest number of civilian fatalities reported in a single incident was nine.
3. Lounge areas include living rooms, common rooms, TV rooms, dens, recreation rooms, family rooms, sitting rooms, music rooms, and the like.
4. This includes all drugs, prescriptions, and other.
5. *The Chronicle of Higher Education,* January 20, 2000.
6. *The Baltimore Sun,* January 4, 2001.
7. *The Washington Post,* November 24, 2001